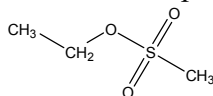


## ETHYL METHANESULFONATE

CAS No. 62-50-0

First Listed in the *Third Annual Report on Carcinogens*



### CARCINOGENICITY

Ethyl methanesulfonate is *reasonably anticipated to be a human carcinogen* based on sufficient evidence of carcinogenicity in experimental animals (IARC V.7, 1974; IARC S.7, 1987). When administered to newborn mice as a single subcutaneous injection or five daily injections in water, arachis oil, or aqueous gelatin, ethyl methanesulfonate induced adenomas or adenocarcinomas of the lung. When administered as a single intraperitoneal injection, ethyl methanesulfonate induced lung tumors in male mice and lung adenomas in mice of both sexes. Three intraperitoneal injections of ethyl methanesulfonate in arachis oil induced lung and kidney tumors in male mice. In a similar study, ethyl methanesulfonate induced renal carcinomas in female rats and a variety of benign and malignant tumors, including lung carcinomas, in rats of both sexes. When administered as a single intraperitoneal injection, ethyl methanesulfonate induced malignant epithelial and mesenchymal tumors of the kidney in rats of both sexes. When ethyl methanesulfonate was administered as a single intraperitoneal injection to mice of both sexes following a single intraperitoneal injection of dimethylnitrosamine, an additive effect in relation to the incidence of malignant kidney tumors was produced by the combination when compared with that produced by dimethylnitrosamine alone. In a study not reviewed by IARC, when administered in the drinking water, ethyl methanesulfonate induced multiple moderately differentiated mammary adenocarcinomas in young rats of both sexes and mature female rats (Ueo et al., 1981).

There are no adequate data available to evaluate the carcinogenicity of ethyl methanesulfonate in humans identified were inadequate (IARC V.7, 1974; IARC S.7, 1987).

### PROPERTIES

Ethyl methanesulfonate is a colorless liquid with a boiling point of 213-213.5 °C. When heated to decomposition, ethyl methanesulfonate emits toxic fumes of sulfur oxides (SO<sub>x</sub>) (Sax and Lewis, 1987).

### USE

Ethyl methanesulfonate is used experimentally as a mutagen, teratogen, and brain carcinogen and as a research chemical (IARC V.7, 1974; Sax, 1981; Sax and Lewis, 1987; Merck, 1989). A potential use is as a chemosterilant. The monoesters of methanesulfonic acid may be reversible insect and mammalian pest chemosterilants, as well as possible human male contraceptives (Jackson, 1964; IARC V.7, 1974).

## PRODUCTION

Ethyl methanesulfonate is not produced commercially in the United States, and no import and export data are reported (HSDB, 1998; USITC, 1986-1991, 1993-1995). Production of ethyl methanesulfonate is likely to be limited to research purposes (IARC V.7, 1974). One U.S. supplier of the compound is currently listed in Chemcyclopedia 98 (Rodnan, 1997).

## EXPOSURE

No permissible exposure limits for ethyl methanesulfonate have been established by OSHA, NIOSH, or ACGIH. The National Occupational Exposure Survey (1981-1983) estimated that potential occupational exposure to ethyl methanesulfonate is 971 total workers, including 448 female workers (NIOSH, 1984). Occupational exposure should currently be limited to laboratory research and housekeeping personnel. Potential exposure for the general population exists if ethyl methanesulfonate is approved for the production of chemosterilants for insects and mammalian pests or as a human male contraceptive. Ethyl methanesulfonate is not known to occur in nature (IARC V.7, 1974).

## REGULATIONS

EPA regulates ethyl methanesulfonate under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Resource Conservation and Recovery Act (RCRA). Ethyl methanesulfonate is a toxic pollutant of water. EPA has established effluent guidelines, rules for regulating hazardous spills, general threshold amounts, and requirements for handling and disposal of wastes. A reportable quantity (RQ) of 1 lb has been established for ethyl methanesulfonate under CERCLA. OSHA regulates ethyl methanesulfonate under the Hazard Communication Standard and as a chemical hazard in laboratories. Regulations are summarized in Volume II, Table B-64.